

CLAIMS.

- 1.- Method for the realisation of a submerged foundation (6,13,16) with blocked vertical thrust, to form a submerged and fixed base to support structures built above the water surface level, characterised by the fact that it foresees the realisation of a body (structure) (6,13,16) that can be filled with air, to be transported to the established location and to be immersed until it is positioned just below the level of wave motion area (8), to be anchored using cables (3) and bracing to counterweights (2) positioned in complete gravity on the sea bottom (1).
- 2.- Method for the realisation of a submerged foundation (6,13,16) with blocked thrust, according to claim 1, characterised in that it foresees the realisation of a body (6,13,16) that can be filled with air, composed of a cylindrical or polygonal recipient, with adequately wide and preferably flat plane upper and lower surfaces equipped with suitable attachments for fixing the cables and bracing and for fixing the support structure of the foundation (6,13,16) or the emerging structure (10).
- 3.- Method for the realisation of a submerged foundation (6,13,16) with blocked thrust, according to claims 1 and 2, characterised in that it foresees a stage wherein the floating body (6,13,16) that can be filled with air and all fixing equipment can be towed on water to its final position.
- 4.- Method for the realisation of a submerged foundation (6,13,16) with blocked thrust, according to claims 1 to 3, characterised in that it foresees a stage of partial immersion of the body (6,13,16) that can be filled with air in its working position down to a level just below the level of wave motion area (8), this partial immersion being performed also with the introduction of an adequate quantity of water into the body (6,13,16) that can be filled with air, in order to cooperate with the weight of the ballast already applied to the body (6,13,16), destined to be later attached to the sea bottom (1), to provide correctly balanced positioning of the said body (6,13,16) at the established level.
- 5.- Method for the realisation of a submerged foundation (6,13,16) with blocked thrust, according to claim 4, characterised in that it foresees the fixing and anchoring of the body (6,13,16) that can be filled with air at the established level, by means of cables (3) and bracing fixed to said structure and to counterweights (2) of concrete or

5 some other suitable material, unloaded from said structure and positioned in complete gravity on the sea bottom (1).

6.- Method for the realisation of a submerged foundation (6,13,16) with blocked thrust, according to claims 4 and 5, characterised in that it foresees a stage of maximum lightening of the body (6,13,16) that can be filled with air, through the
10 gradual unloading of the counterweights (2) of concrete to be used as anchoring on the sea bottom (1), as well as all the ballast used for the partial immersion, including the pumping out of any water that may have been introduced into the body (6,13,16) during a previous stage to ensure conditions of maximum upwards thrust for said body (6,13,16) that in this manner places all cables (3) and bracing in tension and
15 rigidity blocking the structure on the sea bottom (1).

7.- Method for the realisation of a submerged foundation (6,13,16) with blocked thrust, according to claims 1 to 6, characterised in that the floating thrust of the body (6,13,16) that can be filled with air, adequately blocked using a solid system of cables (3) and bracing, furnishes said body (6,13,16) with maximum stability and
20 rigidity, so that said body (6,13,16) is able to support and sustain the weight of a foundation (6,13,16) or structure emerging from the water surface level, to provide for any one of the uses currently foreseen for sea foundation installations.

The aforesaid claims numbered 1 to 7 are to be considered also according to previous use ex art. 6 L.I..

25 8.- Method for foundation (6,13,16) anchoring, comprising the fixing of said foundation using suitable steel cables (3) to connect the foundation both in vertical and diagonal directions to submerged hollow bodies to be positioned under the sea bottom (1) level by burying in the sea bottom (1) sand.

9.- Method for foundation (6,13,16) anchoring, comprising the fixing of said
30 foundation using suitable steel cables (3) to connect the foundation both in vertical and diagonal directions to submerged hollow bodies to be positioned on the sea bottom (1), being completely covered with large scale gravel, where the sea bottom (1) has a rock formation.

- 5 10.- Method for stabilising said foundation (6,13,16) comprising tension cables (5) attached to the external perimeter of the foundation (6,13,16) connected to two struts (4,10) that extend from the centre of the foundation (6,13,16), one in an upward direction towards the water surface and the other in a downward direction towards the sea bottom (1).
- 10 11.- Method for the use of the upper part of the submerged foundation (6,13,16) as a base for a wind turbine installation, through hook attachment, and/or positioning, and/or the realisation in the centre of said foundation (6,13,16) surface of "female" base for the insertion or bolting in said foundation (6,13,16) of the end of a circular piled tower (10), at the top of which is mounted the wind turbine.
- 15 12.- Method of construction, along the piled tower (10) of a suspended platform (9) that circulates around at least a part of the whole diameter, including a "draw-bridge" system on the platform (9) to provide access to the piled tower (10) that rises above the water surface level, and to the technical and technological equipment located inside the piled tower (10).
- 20 13.- Method of construction, using fixing equipment to attach one or more raising cranes to the circumference of the piled tower (10).
- 14.- Method for the use of the hollow part of said piled tower (10) to lodge the electrical installation that will collect the produced eolian energy, the wind turbine technical and technological equipment, including the computerised control unit and safety installation, as well as one or more silos destined to stock the food for the fish
- 25 15.- Method for the realisation of a series of foundations (6,13,16) equipped with wind turbines, connected to each other in alignment.
- 30 16.- Method for the realisation of a submerged floating mariculture installation composed of cages (7), also including "rigid" bases for species that require a sea bottom (1) habitat.
- 17.- Method for automatic feeding of fish species in open sea on artificial sea bottoms (1), comprising one or more silos located inside the hollow body of the wind turbine support tower, said automatic system being supplied with electricity and controlled
- 35 18.- Method for attaching the submerged cages (7) to the foundation (6,13,16),

- 5 comprising either plastic or hard rubber lines , or hooks equipped with elastic shock absorber lines, or with the help of elastic material uprights.
- 19.- Method for fish harvesting and maintenance of submerged cages (7) through the positioning of mobile nets inside the cages (7), said nets being raised by cranes positioned on the work platform of the wind turbine tower (10).
- 10 20.- Combination of innovative techniques for the conception, project design, and realisation of a submerged floating foundation (6,13,16) with blocked thrust, combined with the use of the upper part of the foundation (6,13,16) as a base for a wind turbine in combination with and submerged upper surface of the foundation (6,13,16) as a base for attaching a fish farming installation.
- 15 21.- Submergeable floating foundation for carrying loads or structures (10) having a floating foundation body (6,13,16) and an anchoring system (2,3) on the bottom (1) of the sea or a lake wherein said anchoring system comprises chains or cables (3) **characterized in that** said chains or cables (3) are as short as to provide that the floating foundation body (6,13,16) floats below the wave motion area (8) of said sea or lake.
- 20 22.- Floating foundation according to claim 1, **characterized in that** the floating body (6,13,16) is made from hollow metal tubes which are preferably welded to each other and fillable with water and gas.
- 23.- Floating foundation according to claim 1, **characterized in that** the floating foundation body (16) is made from a hollow concrete chamber fillable with water and gas.
- 25 24.- Floating foundation according to one of the prescribing claims, **characterized in that** the foundation body has multiple connection facilities for connecting the lower side of that floating body (6,13,16) with the bottom (1) of the sea or lake.
- 30 25.- Floating foundation (6,13,16) according to claim 4, characterized in that said connection devices are connected to the bottom (1) of the sea or lake utilising said cables or chains (3).
- 26.- Floating foundation according to claim 5, characterized in that said cables or chains (3) are connected to counterweights (2) placed on or dugged into the bottom (1)
- 35 of the sea or lake.
- 27.- Floating foundation body according to claim 6, characterized in that said counterweights (2) comprise hollow chambers in order to make them floatable when

- 5 filled with gas wherein said hollow chambers are designed to be filled with water or sand as well for depositing them on the bottom (1) of the sea or lake.
- 28.- Floating foundation according to one of the preceding claims, characterized in that the foundation body has vertical struts (4,10,23) extending vertically on the foundation body (6,13,16) wherein said struts (4,10,23) are preferably connected with
10 tension cables (5) with the rim of said foundation body (6,13,16).
- 29.- Foundation body according to any of the preceding claims, characterized in that the floating body carries a turbine tower (10) which carries a wind turbine (12) on its uppermost end.
- 30.- Floating foundation according to any of the preceding claims, characterized in
15 that the vertical strut (4,24) and the turbine tower (10) respectively carry a working platform (9).
- 31.- Floating foundation according to claim 30, characterized in that said working platform (9) carries at least one crane.
- 32.- Floating foundation according to one of the preceding claims, characterized in
20 that the turbine tower (10) provides hollow chambers for electrical installations including electronical control of the wind turbine (12).
- 33.- Floating foundation according to one of the preceding claims, characterized in that the turbine tower (10) contains chambers for storing food, especially fish food.
- 34.- A series of floating foundations of one of the preceding claims, characterized in
25 that the foundation bodies are connected to each other.
- 35.- Floating foundation according to one of the preceding claims, characterized in that above or below the foundation body (6,13,16) a mariculture installation (7) is provided.
- 36.- Floating foundation according to claim 35, characterized in that the mariculture
30 installation (7) provides a rigid base platform.
- 37.- Floating foundation according to claim 35 or 36, characterized in that it provides a cage (7) or net or the like.
- 38.- Floating foundation according to any of the preceding claims, characterized in that the working platform (9) contains a feeding automat for fish feeding, wherein
35 said feeding automat preferably is electrically connected to the electrical output of the wind turbine.
- 39.- Floating foundation according to one of the preceding claims, characterized in

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- 5 that the mariculture installation contains cages (7) made from plastic or rubber lines and/or mobile net inside the cages (7).

40.- Floating foundation according to any of the preceding claims, characterized in that the working platform (9) contains an access segment (26) for landing to the working platform.

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